

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Amendment of Part 15 regarding new) ET Docket No. 04-37
requirements and measurement)
guidelines for Access Broadband over)
Power Line Systems)
)

REPLY COMMENTS OF AT&T CORP.

AT&T Corp. (“AT&T”) submits the following reply comments regarding Access BPL¹ in the above-entitled Notice of Proposed Rulemaking, (“*NPRM*” or “*Notice*”).

The comments in this proceeding run the gamut. On one hand, critics of BPL contend that it will generate harmful interference which cannot be prevented through compliance with the Part 15 emission limits or the use of interference mitigation measures,² while commenters who are providing BPL report that their systems comply with the Commission’s Part 15 requirements and have caused no harmful interference. As a potential user of BPL and potential provider of BPL-based services, AT&T and its

¹ Throughout these reply comments AT&T will use the term “BPL” to refer to Access BPL.

² See, e.g., ARRL Comments at 2-3; PARI Comments at 1-5.

AT&T Labs³ have reviewed the comments in this proceeding and have made initial examinations of certain BPL systems to determine whether such systems can be deployed without causing harmful interference to licensed users. Based on this initial analysis, as summarized below, AT&T believes that potential interference is a legitimate issue, but that a properly designed, maintained and operated BPL system can avoid causing such interference through compliance with the existing Part 15 emission limits and other Part 15 requirements. AT&T also addresses in these reply comments issues raised by the comments regarding the proper definition of “Access BPL” and the proposed centralized database.

I. Compliance With The Part 15 Rules Should Resolve Interference Concerns.

In their comments, current providers of BPL equipment and services establish that the provision of BPL in compliance with the existing Part 15 rules removes any significant risk of interference to licensed spectrum users. For example, APPA⁴ notes that the City of Manassas has been offering BPL for almost two years and has not caused any reported instances of harmful interference.⁵ Indeed, the City of Manassas has

³ AT&T Labs is the world’s leading telecommunications services research and development organization with approximately 5,500 scientists, engineers and information technology specialists focused on developing the systems and tools for the network of tomorrow and serving customers today. AT&T Labs is a leader in technologies and standards for advanced network design and architecture, network operations systems, electronic commerce and digital rights management, search and directory services, audio, speech, video and image compression, data mining and visualization tools, and future broadband technologies.

⁴ A list of the commenters referenced in these reply comments showing the abbreviated references is attached.

⁵ APPA Comments at 5.

gone out of its way to involve and consult with amateur radio operators regarding its roll-out of BPL, and reports that its system complies with the Part 15 rules.⁶ NTIA, in its recently released technical report on potential BPL interference,⁷ concludes that BPL networks “can be successfully implemented under existing [Part 15] field strength limits.” NTIA Report at vi.⁸

AT&T’s preliminary evaluation of BPL systems confirms the NTIA’s assessment that BPL systems can be deployed without causing harmful interference. A BPL system potentially could cause three types of interference to licensed users, *i.e.*, interference caused by (1) the coupler field surrounding the coupler, (2) the guided wave phenomenon between the wire and the ground, and (3) radiation from the wire. The coupler field should have a minimal role in interference because it is highly localized and decays rapidly. The guided wave is a localized phenomenon between the medium voltage wire and the ground, which decays rapidly perpendicular to the wire.⁹ Finally, the radiated emissions from a BPL system tend to be concentrated on-axis and extend primarily from the end of the wire. As a result, the practical impact of such interference

⁶ City of Manassas Comments at 3 and attached letter. *See also* Main.net Comments at 7 (the Amateur Radio Club, using its monitoring equipment, has determined there is no harmful interference caused by the Manassas BPL system).

⁷ The NTIA report can be accessed at <http://www.ntia.doc.gov/ntiahome/fccfilings/2004/bpl/index.html>

⁸ The NTIA report also recommends modifications to the BPL compliance measurement provisions in order to correct “underestimation” of peak field strength. As noted in its comments, AT&T agrees with NTIA that compliance measurements should be modified as necessary to ensure the most accurate estimation of peak field strength. AT&T Comments at 7.

⁹ The guided wave decays rapidly as one moves away from the medium voltage wire, both horizontally and vertically (above the wire).

is likely to be small because of the extremely narrow angle of the emissions and the reduction in emissions range caused by “non-idealities” in the medium voltage lines, such as bends, ohmic dissipation, and coupler loss. AT&T’s initial analysis thus confirms the findings of commenters that a properly engineered, maintained, and operated BPL system should comply with the existing Part 15 emission limits and thus appropriately limit harmful interference.¹⁰ As UPLC aptly summarizes, “the interference potential is low and quite manageable.”¹¹

Moreover, under the Commission’s rules, in the event that a BPL system causes harmful interference, the operator is required to eliminate the interference. The operator can do so in a variety of ways, *e.g.*, by reducing the power through the affected portion of the system, by ceasing to use specific portions of the spectrum (frequency notching), or in extreme circumstances by effectively “shutting down” the customer’s service, which may or may not involve “deactivation” of the actual unit. There is, however, no “one-size-fits-all” solution. Indeed, the potential for interference will depend on the type of BPL system that has been deployed. For example, a BPL system operating in the less than 30 MHz frequency range would not be a likely source of

¹⁰ *See, e.g.*, APPA Comments at 5 (Manassas experience provides “strong evidence that existing Part 15 rules are more than sufficient to limit harmful interference”); Current Technologies Comments at 3 (“extensive real-world experience with Part 15 limits show they offer adequate protection to licensed services”); Main.net Comments at 5 (Access BPL can operate successfully under the non-interference requirements of the Part 15 rules); Progress Energy Comments at 5 (“a properly designed and operated Access BPL system will pose little interference hazard”); Southern Comments at 16-17; UPLC Comments at 2-3.

¹¹ UPLC Comments at 3.

potential interference to first responder public safety agencies (30-50 MHz band),¹² TV channels 2-6,¹³ aeronautical-related outer marker beacons (74.8-75.2 MHz),¹⁴ or radio call boxes using 72 and 75 MHz channels.¹⁵

Because each system will have different operational parameters, including the frequency involved, the equipment deployed, the geographic scope of the deployment, and the surrounding topography, it is the BPL provider who is in the best position to know what remedy would be appropriate in the event that harmful interference occurs. As several commenters point out, the provider must have the latitude to resolve the interference issue through mitigation measures such as changing the operating frequency, frequency notching, or power management, before taking the ultimate step of shutting down service.¹⁶ Instead of attempting to specify, in advance, particular actions that operators must take in response to what should be isolated instances of interference, or particular functionalities that operators must design into their

¹² See APCO-NPSTC Comments at 3 (30-50 MHz); Missouri State Highway Patrol Comments at 2 (42 MHz).

¹³ CEA Comments at 5.

¹⁴ ARINC Comments at 5.

¹⁵ IMSA Comments at 2; APCO-NPSTC Comments at 3.

¹⁶ See, e.g., Con Edison Comments at 4 (“adjustment of operations is a permissible method to avoid or mitigate harmful interference”) (emphasis in original); Progress Energy Comments at 6 (system performance can be adjusted remotely to eliminate harmful interference); Sprint Comments at 3-4 (most effective way to deal with interference is to switch frequency bands); UPLC Comments at 10 (BPL providers should be “permitted to correct harmful interference by notching or shifting frequencies first, rather than requiring them to automatically shut down immediately”).

equipment, the Commission should allow operators the latitude to determine how best to meet Part 15's mandate, especially in the initial deployment stage.

BPL promises to bring the benefits of high-speed data and competitive voice over Internet protocol (VoIP) to millions of Americans. Current Technologies reports that 100 Mbps chip sets should become commercially available in late 2005 or early 2006.¹⁷ AT&T believes that 200 Mbps chip sets will be available for initial testing by the end of this year. In light of the potential benefits that could be realized through introduction of a facilities-based alternative to the DSL/cable broadband duopoly¹⁸ and the Bell local exchange monopoly, the Commission should act to facilitate the deployment of BPL technology.

In addition to the benefits that would be realized through deployment of competitive high-speed data and VoIP services, deployment of BPL will permit electric utilities to deploy operational enhancements that will provide increased reliability and convenience to their electricity customers. Such enhancements include reclosure operation,¹⁹ power quality monitoring, automated meter reading, automatic connect and

¹⁷ Current Technologies Comments at 8.

¹⁸ As Chairman Powell has observed, "the Holy Grail is when you get to three [broadband access technologies in every home]. Magical things happen in competitive markets when there are three. Magical things happen when there is real choice and pressures for innovation" Remarks of Michael K. Powell, Chairman, Federal Communications Commission, at the FCC Wireless Broadband Forum, May 19, 2004, Washington, D.C., *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-247411A1.pdf

¹⁹ This would allow the utility to remotely open and close circuit breakers on the electric distribution system. Southern Comments at 4.

disconnect, and system security.²⁰ As Oncor points out, many electric utilities could not afford to deploy these operational enhancements without the promise of additional revenues provided by the high-speed data and VoIP services enabled by BPL.²¹

II. Other Matters

A. The “Access BPL” Definition

In the Notice, the Commission proposed the following definition of “Access BPL”:

[a] carrier current system that transmits radio frequency energy by conduction over electric power lines owned, operated, or controlled by an electric service provider. The electric power line may be aerial (overhead) or underground.

Notice ¶ 32. Several commenters request that the Commission modify the definition of “Access BPL” to make clear that it does not include narrowband Power Line Carrier Systems (PLCS), low-speed automatic meter reading systems, and In-House BPL.²² AT&T supports such clarification.

Duke also requests that the definition be revised to require that all BPL equipment must be “owned, installed, and maintained” by the electric utility.²³ Southern similarly requests that the proposed Access BPL rules make clear that all equipment used to provide Access BPL be “installed, owned, and/or operated” by the electric utility or its

²⁰ *Id.* at 4-5.

²¹ Oncor Comments at 1.

²² *See, e.g.*, Duke Comments at 3 (exclude PLCS and In-House BPL); Echelon Comments at 3 (exclude existing carrier current devices); PSRC Comments at 1-2 (Access BPL rules do not apply to PLCS); Southern Comments at 13-14 (exclude PCS, low-speed automatic meter reading systems, and In-House BPL); UPLC Comments at 4 (exclude PLCS and automated meter reading systems).

²³ Duke Comments at 4.

affiliate.²⁴ Although Southern states (at 14) that there should be no limitation on the nature or scope of business relationships that may be created to provide BPL, AT&T is concerned that the modifications proposed by Duke and Southern could be read to preclude certain business relationships. As Ameren, Sprint, and NRTC/NRECA recognize, entities other than the electric provider might own or operate BPL systems.²⁵ AT&T therefore urges that the Commission refrain from restricting ownership or operation of BPL equipment or systems. At the same time, AT&T recognizes there are legitimate safety issues associated with the installation and maintenance of BPL equipment. AT&T accordingly would support the requirement proposed by Southern (at 14) that all installation and maintenance of BPL equipment involving energized power lines or attachments made in the electric supply space be performed by the electric utility or by utility approved contractors, without any limitation on who may own or operate the BPL system.

B. The BPL Database

In its comments, AT&T supported the concept of an industry-operated database of BPL deployment, but was concerned that unfettered access to such a database would allow the entrenched broadband providers to determine when and where introduction of competitive BPL service was planned.²⁶ Several current and potential

²⁴ Southern Comments at 14.

²⁵ Ameren Comments at 3-4; Sprint Comments at 2-3; NRTC/NRECA Comments at 5-6.

²⁶ AT&T Comments at 7. As could be expected, two of the entrenched providers request that any database be publicly accessible. BellSouth Comments at 6-7; Verizon Comments at 1.

BPL providers share this competitive concern as well as concerns regarding the security of critical infrastructure. Southern, for example, raises competitive and security concerns regarding disclosure of the precise locations of BPL deployment in a publicly accessible database.²⁷ Sprint likewise has competitive concerns regarding such a database,²⁸ while Duke and PSRC are concerned about the security and competitive implications of public access to such a database.²⁹ Indeed, Southern notes (at 9) that the existing PLCS database is maintained on a confidential basis. And, some commenters, such as Ameren, PLCA and Progress Energy, oppose entirely the creation of such a database.³⁰ These comments confirm that any centralized database of BPL deployment should contain only the information needed to address potential instances of interference, and should not be publicly accessible.

Conclusion

AT&T supports the Commission's efforts to promote the development of an alternative broadband path to American consumers. The comments of current and potential BPL providers, and AT&T Labs' initial analysis of BPL systems, confirm that application of the existing Part 15 emission limits and other Part 15 requirements should resolve interference concerns. In the isolated event of harmful interference, the BPL

²⁷ Southern Comments at 8-9.

²⁸ Sprint Comments at 4.

²⁹ Duke Comments at 8-9; PSRC Comments at 1. *See also* Main.net Comments at 7-8 (does not agree with the breadth and scope of information requested for a publicly accessible database); UPLC Comments at 11-12 (security and competitive concerns).

³⁰ Ameren Comments at 9; PLCA Comments at 2-3; Progress Energy Comments at 7-8.

provider must have the latitude to resolve the problem using methods that best fit the provider's particular system. AT&T therefore respectfully submits that the Commission should refrain from imposing specific interference mitigation requirements on BPL operators unless and until experience gained from initial BPL deployments demonstrates an actual need for such measures.

AT&T supports requests to clarify the definition of Access BPL so that it does not inadvertently include narrowband PLCS, low-speed automatic meter reading systems, and In-House BPL. AT&T, however, urges the Commission to refrain from restricting the ownership or operation of Access BPL equipment or systems. Finally, AT&T respectfully submits that any centralized database of BPL deployment should contain only the information needed to address potential instances of interference, and should not be publicly accessible.

Respectfully submitted,

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Dated: June 22, 2004

List of NPRM Commenter References

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|--|-----------------------------------|
| Aeronautical Radio, Inc. | ARINC |
| Ameren Energy Communications Inc. | Ameren |
| American Public Power Association | APPA |
| Amperion, Inc. | Amperion |
| Association of Public-Safety Communications Officials – International, Inc.; National Public Safety Telecommunications Council | APCO-NPSTC |
| BellSouth Telecommunications, Inc. | BellSouth |
| City of Manassas, Virginia | City of Manassas |
| Consolidated Edison Company of New York, Inc. | Con Edison |
| Consumer Electronics Association | CEA |
| Current Technologies, Inc. | Current Technologies |
| Duke Energy Corporation | Duke |
| Echelon Corp. | Echelon |
| Electric Broadband | Electric Broadband |
| HomePlug Powerline Alliance | HomePlug Alliance |
| IEEE Power System Relaying Committee | PSRC |
| International Municipal Signal Association | IMSA |
| Main.net Communications Ltd. | Main.net |
| Missouri State Highway Patrol | Missouri State Highway Patrol |
| National Association of Amateur Radio | ARRL |
| National Telecommunications and Information Administration | NTIA |
| National Rural Telecommunications Cooperative; National Rural Electric Cooperative Association | NRTC-NRECA |
| Oncor Electric Delivery Company | Oncor |
| Power Line Communications Association | PLCA |
| Progress Energy, Inc. | Progress Energy |
| Southern LINC, Southern Telecom, Inc., Southern Company Services, Inc. | Southern |
| Sprint Corporation | Sprint |
| United Power Line Council | UPLC |
| The Verizon telephone companies | Verizon |

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The undersigned hereby certifies that on this 22nd day of June, 2004, a copy of the foregoing Reply Comments of AT&T Corp. was served by U.S. mail, postage prepaid, on the following:

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